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An Informal Letter
of
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
Forest Insect Investigations

P.O. Box 3010, Stanford University, Calif., June 1, 1927

SELECTION OF THE FITTEST by H.L. Person

Tree selection studies, to determine the characteristics of trees most susceptible to attack by the western pine beetle, have been carried on for the past three years. As soon as a suitable area is found, the results of these studies are to be applied in an experimental marking and cutting of a body of yellow pine, to determine whether or not the insect losses on cut-over areas can be reduced by a more careful selection of the trees to be left.

To get some idea of the difficulties that will be encountered in the marking of this experimental area, a sample marking of ten acres was made on the Cascadel area. As the sample plot is not to be logged it will be of value only in determining the practicability, from the management standpoint, of taking out all trees which with our present knowledge we consider most likely to be killed by the western pine beetle.

The ten acres used is fairly typical of the west side pure yellow pine stands on Site III. The insect loss runs around 15 to 20 trees per section annually. A complete record was made of each yellow pine over ten inches in diameter on this plot. This record included the crown class, growth rate and description of all the external characters as well as site data, such as slope and exposure.

In selecting the trees to be marked as constituting a poor risk from the insect standpoint, growth rate and diameter class were considered of most importance. Secondary factors, such as the size and condition of the crown and injuries, were also considered. In the tree selection studies referred to it was found that 91 per cent of the trees killed by the western pine beetle had an annual growth ring less than one millimeter in width. All trees, then, with an annual ring less than one millimeter in width were marked to be cut except a few small, young trees, the growth rate of which would probably be accelerated after the stand was opened up.

It has also been found that trees between 20 and 30 inches in diameter are more apt to be killed by D.b. than trees in any of the other diameter classes. Because of this trees between 20 and 30 inches in diameter were marked to be cut unless they were particularly vigorous.

The problem was to take out all the trees which should be removed because of probable susceptibility to insect attack as well as for the other reasons for which trees are marked, and still leave about 20 per cent of the original stand fairly well distributed over the area.

The following table gives an idea of the character of the trees cut and left. A fairly good distribution of the trees left was secured with no opening of more than two acres:

	<u>Cut</u>	<u>Left</u>	<u>% Left</u>
Number of Trees - - - - -	-206-	-138-	-33
Volume - - - - -	123,400 b.f.	32,650-	-20.9
Diameter of Trees - Min. - - - - -	12-	-12	
Max. - - - - -	-44	-34	
Mean- - - - -	22-	-18	
No. of Trees by 10" diam. Groups			
12" to 20" - - - - -	-66-	-45	
22 " 30 - - - - -	-50-	-22	
32 " 40- - - - -	-19-	-1	
Growth Rate of Trees (width of 1926 ring in millimeters)			
Min. - - - - -	.10 - - -	.86 (12" tree)	
Max. - - - - -	2.20- - -	-4.10	
Mean- - - - -	.90 - - -	2.00	

Cats Used in War on Beetles!

The Sand Creek Control Project, which is being carried on against the mountain pine beetle epidemic in lodgepole pine along the eastern boundary of Crater National Park, started under difficulties this spring. J.E. Patterson, who is directing the work for the Park Service, describes operations to date as follows:

"In the first place the snow conditions in these stands are a much greater problem than we have ever experienced before. This greatly delayed our start and has been, and still is, a serious hindrance to the prosecution of the work. My present camp is located at the East Entrance and the Forest Service camp, under Lee Brown, is about a mile distant in the F.S. Project area. There is six feet of hard-packed snow at my camp and about four feet at Brown's. It is impossible to get into either camp with cars or trucks.

"On May 10 I hired two men and started moving supplies into the South Entrance cabin. This necessitated opening the road for a distance of two miles. On May 23 a crew of twelve men was moved to the South Entrance. This crew was split; one bunch was sent to the East Entrance to open the road, while the other was taken to Government Camp over the snow to sled out the equipment. A Park Service caterpillar, left in the Park last fall, was put together at Anna Spring and the equipment moved out over the snow with it. We are using this cat at the present time to get supplies into our camp and also Brown's.

"On May 25 we succeeded in moving all our stuff to the East Entrance. Spotting up of this area was started May 26. The first trees were treated on the 27th. In spite of the adverse weather conditions we are treating an average of 100 trees per day. Our overhead this year will be greater than before, although I feel we shall be able to clean up the project with the funds provided. We shall finish the east side by June 1 and then move to the west side. This is a twelve-mile move over snow from 6 to 10 feet deep. By using three bobsleds behind the cat we can make the move in one trip. Of course it will be impossible to turn the logs until the snow is gone, but by felling them now development of the broods will be checked and held until we can turn them. Indications are that the emergence of the beetles this season from standing trees will not be much later than usual. Hence the necessity of getting the trees down now.

"Verily, control work under the conditions we have calls for the experience of arctic training!"

Ips Infestation
in the Prescott National Forest, Arizona

Sporadic attacks of Ips on western yellow pine have occurred in the Prescott National Forest during the past few years. The area infested bears a very dense stand of timber 20 to 40 years of age, which replaced the mature stand logged off during the boom days of Prescott and Jerome, two important mining towns of Arizona.

A few small groups and scattered trees of the original stand remain. Strange to say, with all the logging of the past, there is no evidence of insect loss to the mature trees. It is only recently, since the demand for better highways has arisen and the young forest has been opened up, that losses have occurred from secondary insects breeding in the slash.

In 1926, during the construction of a state highway cut-off, 5 miles of road 12 feet wide was cut through a dense stand of young yellow pine, ranging in diameter from 2 to 14 inches. Most of the cutting was done during May and June, but it continued during July. The road was finished in August.

The brush was piled and the tops and trunks made into cordwood, which was piled on each side of the road. Later the wood was removed and the brush burned, not, however, before the summer brood of Ips had emerged and attacked the saplings and small trees along the side of the roads.

According to local forest officers, the attacks on the green timber took place in August, September and October. 609 trees from 2 to 14 inches in diameter were killed. The dead trees occurred in groups of from 4 to 200, and were scattered along the entire 5 miles of road where it ran through the timber.

The 609 trees killed made 45 cords of wood. The estimated amount of wood cut in clearing out the road was 100 cords. Ten cords of this was oak and juniper. This reduction in volume of wood infested indicates that there was a 50 per cent loss in the beetles attacking the green timber. This is also indicated by the noticeable "pitching out" on many trees.

Examinations of the killed trees made in April and May, 1923, indicate that there has been no development of broods in sufficient numbers to make a successful attack this spring. Not a single living tree was found that had been attacked. Apparently the infestation ended with the attacks of 1926.

Three species of Ips were involved in the Prescott infestation. Trap trees cut by the local forest officers between November 1, 1926, and April 1, 1927, were attacked lightly about April 1. Dr. M.W. Blackman examined the infested traps in May and collected the following species of beetles: Ips calligraphus (Germ.) 6-spined, I. confusus (Lec.) 5-spined, and I. integer (Eich.) 4-spined.

W.D. Edmonston.

Field Activities

Field activities of the western workers started April 4 with the departure of H.L. Person for Northfork, Calif. Person expects to spend the summer there studying various activities of the western pine beetle. Senior Scientific Aid Albert Wagner and Field Assistants George Struble of Stanford University and Donald DeLeon of the New York State College of Forestry will assist him.

J.E. Patterson left April 15 for Ashland, Oregon. "Pat" has charge of the control work against the mountain pine beetle in Crater National Park, and also the study of the effect of repellants and attractants on the mountain pine beetle.

W.D. Edmonston and George Hofer left Tucson, Ariz., early in April for Prescott, where they made a study of Ips infestation in second-growth yellow pine. Edmonston will spend June in the Yellowstone and July in the Glacier with Burke. Hofer expects to return to Tucson in June.

Dr. M.W. Blackman left for Prescott the last of April and spent two weeks on the Ips-infested area. He then left for Colorado, where he will spend the summer studying an active epidemic infestation of the Black Hills beetle in Rocky Mountain yellow pine.

F.P. Keen and his crew of field assistants--W.J. Buckhorn, Max England of the Oregon Agricultural College and H.G. Sabine of the University of California--left Palo Alto May 17 for Klamath Falls, Ore. The summer will be spent on a study of the results of the Southern Oregon-Northern California Project control work.

Dr. H.E. Burke expects to leave June 8 for West Yellowstone, Montana. Spraying to control the lodgepole needletyer will be carried on in Yellowstone National Park, and a study made of a budworm infestation in Douglas fir in the Shoshone National Forest, Wyoming. On July 10 Burke will leave for Glacier National Park to study the forest insect conditions found there.

J.C. Evenden is spending May and June on the Beaverhead-Bitterroot Control Project in Montana. Heavy weather conditions have greatly increased the difficulties of the work, but there is still hope that it will be finished as planned. A.L. Gibson and H.J. Rust are assisting in the work.

Serious Scale Infestations
Reported to O.A.C.

Specimens of Coulter pine collected in the vicinity of Little Bear Lake, San Bernardino County, have been received. These are heavily infested with Chionaspis pinifoliae, and are accompanied by the information that a large percentage of the young trees are dying, apparently from the heavy scale attack.

Men occupied in the blister rust survey work in British Columbia have brought in specimens of yellow pine (P. ponderosa) encrusted with the same species of scale, with the report that young trees over a considerable area are suffering severely.

No signs of parasites were noted in the California material, but a study of the insects from British Columbia showed that from 24 to 51 per cent were parasitized, with an average degree of 37 per cent.

W.J. Chamberlin.

One of the Oldest Barkbeetles

The State Mining Bureau recently turned over to Mr. Hill, in charge of Forest Products for District 5, a small section of fossil wood that had been uncovered in a placer mining operation in the Feather River country below Lake Almanor. The specimen came from a gravel deposit that was preglacial in origin, probably of the Middle Pliocene period, which, according to some systems of rating geologic time, would give it an age of something like a million years.

It has not as yet been possible to determine the species of tree from which this wood fragment came, but imbedded in the wood was found an almost perfect specimen of a scolytid beetle. This was turned over to the California Academy of Sciences, and was determined by Dr. E.C. Van Dyke as one of our modern species, Hylastes macer Lec., which is common in dying yellow pine. This form seems to represent one of the oldest groups of scolytids, and apparently this species has not changed throughout a series of recent geological periods.

J.M.M.

It's Up to the Contributors

This will be the last issue of the News Letter until the close of the field season. We shall get out an issue August 1 providing the notes and articles are sent in to Palo Alto. Surely the field men will have accomplished something worth writing about by that time!

Ed.